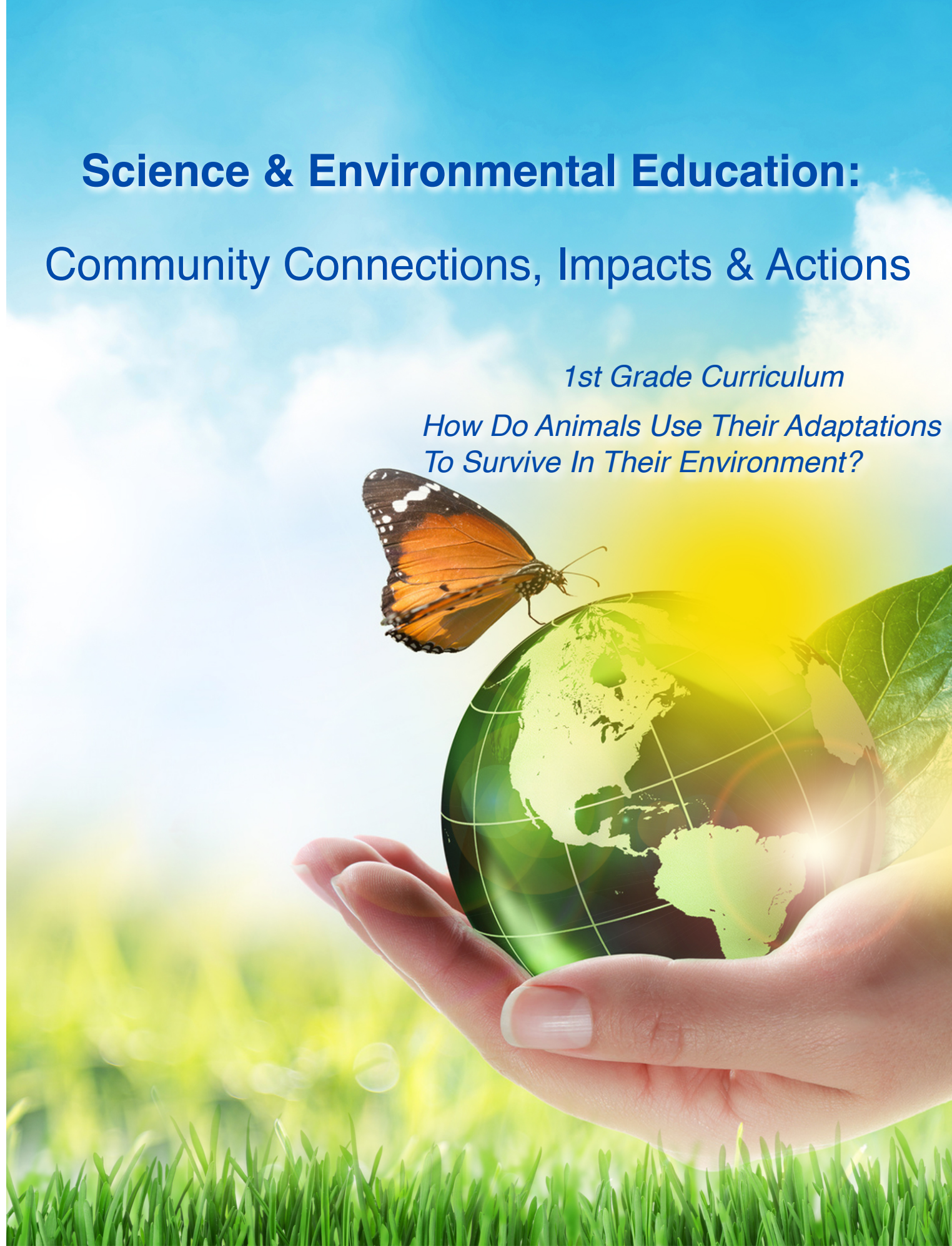


Science & Environmental Education:

Community Connections, Impacts & Actions

1st Grade Curriculum

*How Do Animals Use Their Adaptations
To Survive In Their Environment?*



Purpose of

ENVIRONMENTAL EDUCATION

Environmental education is a lifelong learning process that leads to an informed and involved citizenry, having the creative problem-solving skills, scientific and social literacy, ethical awareness and sensitivity for the relationship between humans and the environment, and commitment to engage in responsible individual and cooperative actions.

By these actions, environmentally literate citizens will help ensure an ecologically and economically sustainable environment.



The following two-week integrated unit is designed for teachers and students to engage in an interdisciplinary study of science and the environment through literacy and math lessons. The lessons and activities are not meant to be done in isolation, but in support of and during literacy and math time.

Each lesson has a suggested structure with room for teachers to infuse more interactive play, discussions, or videos as well as adjust pacing as makes sense for their class. The summative assessment is designed to assess the NGSS, with several formative checks along the way for CCSS, used as the teacher sees fit.

This unit connects to the specific literacy theme of “Investigation.” Students will be studying biomimicry, which is the investigation of how we can use animals and plants as models for human technologies.

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Students in Wisconsin will be able to:

- Develop and connect with their sense of place and well-being through observation, exploration and questioning.
- Investigate and analyze how change and adaptation impact natural and cultural systems.

This integrated unit uses NGSS and CCSS as the backbone to planning and infusing environmental education standards into the curriculum.

Wisconsin Standards for Environmental Literacy and Sustainability

NGSS PERFORMANCE EXPECTATION	DISCIPLINARY CORE IDEAS	SCIENCE AND ENGINEERING PRACTICES	CROSS CUTTING CONCEPTS	COMMON CORE ELA	COMMON CORE MATH
1-LS1-1 Use materials to design a solution to a human problem by mimicking how plants and/or animals use their external parts to help them survive, grow and meet their needs.	Animals have body parts that capture and convey different kinds of information needed for growth and survival. Animals respond to these inputs with behaviors that help them survive. Plants also respond to some external inputs.	Use materials to design a device that solves a specific problem or a solution to a specific problem.	Every human-made product is designed by applying some knowledge of the natural world and is built using the same materials derived from the natural world.	CCSS.ELA-LITERACY.RI.1.8 Identify the reasons an author gives to support points in a text. CCSS.ELA-LITERACY.RI.1.9 Identify basic similarities in and differences between two texts on a same topic. (e.g. in illustrations, descriptions, or procedures). CCSS.ELA-LITERACY.RI.1.10 With prompting and support, read informational text appropriately complex for grade 1. CCSS.ELA-LITERACY.W.1.8 With guidance and support from adults, recall information from experiences or gather information from provided sources to answer a question.	CCSS.MATH.CONTENT.1.MD.C.4 Directly compare two objects with a measurable attribute in common, to see which object has “more of”/“less of” the attribute, and describe the difference.

Day 1: [Plant Adaptations](#)

Day 2: [Animal Adaptations](#)

Day 3: [Animal Don't Wear Clothes](#)

Day 4: [Purpose of Adaptations](#)

Day 5: [Camouflage](#)

Day 6: [Movement Adaptations](#)

Day 7: [Animal Adaptations Field Experience](#)

Day 8: [Introduction to Biomimicry](#)

Day 9: [Inventions From Nature](#)

Day 10: [Summative Assessment](#)



Read: [*The Dandelion Seed*](#) by Joseph Anthony

Discussion: How do plants travel?

Have students discuss in groups the following questions:
How do dandelion seeds travel? How do the seeds from other plants travel? Talk about how plants adapt to their environment.

Watch: [*Plant and Animal Adaptations*](#)

The first two minutes talk about features of plants. The last six minutes could be incorporated into another lesson.

Explore: BrainPop Jr [*Plants*](#)

Activity: Reader's Workshop

Using nonfiction books and worksheets (See [*Unit Resources*](#) for examples), discuss what labels are and why pictures are labeled. Use the printable booklet in [*ScienceWorks for Kids: Learning about Animals*](#) (Pages 14- 16) to demonstrate how labels help describe pictures. Have students circle the labels in the pictures.

Science Journal Prompt:

How do different parts of plants help them survive?

Students should reflect, in writing or pictures (dependent on student level), how different structures of plants (roots, leaves, flowers, seeds, etc.) help a plant survive in its environment.



Read: [*I See Animals Hiding*](#) by Jim Arnosky

Watch: NH PBS [*Adaptation*](#)

Discussion: Adaptations of feathers

As a whole group (or in collaborative table groups) brainstorm adaptations of different animals. Discuss the adaptation of a duck's waterproof feathers last, as an introduction to the waterproof activity.

Activity: Waterproofing Experiment

Have the students use real bird feathers to test how water repels off the feather. Have the students write predictions and record observations in their science journals. Using an eye dropper, place a couple drops of water on the feather. Observe how the water moves on the feather. Repeat the experiment with oil. Discuss the differences between what happened with the water and oil. Talk about how the waterproofing comes from oils from the duck and how preening helps spread those oils.

Science Journal Prompt:

How do animals use different adaptations?

Students should reflect in writing or pictures (dependent on student level) how animals use different adaptations to help them survive in their habitat.

Optional: [*SwitchZoo*](#)





Read: *Animals Should Definitely Not Wear Clothing* written by Judi Barrett and illustrated by Ron Barrett

Activity: *How Animals Meet Their Needs*

Discussion: Animal coverings

Have students observe different examples of animal body coverings by studying pictures of animals. Use the chart below to record the different types of coverings they see.

Animal	Feathers	Scales	Hair	Skin

Science Journal Prompt:

Why do different animals have different coverings?

Students should reflect in writing or pictures (dependent on student level) how animals use their body coverings to survive in their habitat.

Optional: *Animal Body Coverings*

Read: [Breathtaking Noses](#) by Hana Machotka

Activity: [Adaptations Game](#)

Collaboratively on SmartBoard or individually on iPads

Discussion: **Purpose of adaptations**

Have students observe animal adaptations by studying pictures of animals. As they identify adaptations have them record the adaptation and its function: climate, oxygen, water, food, or protection/shelter. Have them justify the chosen function. *(This can be done as a whole class or individually.)*

Animal	Climate	Oxygen	Water	Food	Protection/ Shelter

Activity: [Animal Adaptation Matching Game](#)

Cut the cards into puzzle piece shapes and have students match the adaptation to the animal. Once they think they have found their match, have the students should explain their reasoning.

Science Journal Prompt:

Why are noses different?

Students should reflect in writing or pictures (dependent on student level) on the differences between the structure of an animal's nose and how it is used.





Read: *Nature's Paintbrush: The Patterns and Colors Around You* by Susan Stockdale or *How to Hide a Polar Bear and Other Animals* by Ruth Heller

Activity: Camouflage Worms

Prior to taking the students on a hike, create “worms” by cutting various colored yarn into two-inch lengths. Spread the “worms” along the trail. Have the students find as many “worms” as they can during the hike. When the class returns to the classroom, discuss which color “worms” had the best camouflage and which colors stood out the most (can be made into an indoor activity).

Discussion: **How can animals use color to help camouflage themselves?** Students should collaboratively draw a picture and write key words describing how animals use color.

Science Journal Prompt:

How does the color of an animal help it survive?

Students should reflect in writing or pictures (dependent on student level) on how animals use camouflage to blend into their habitat.

Optional: *Camouflage Game*



Read: [Biggest, Strongest, Fastest](#) by Steve Jenkins

Activity: [Let's Go To The Zoo](#)

Have students move like the animals in the video

Discussion: How do different animals move and why do they move that way? Have students make an anchor chart on the ways animals move: swim, jump, fly, run, wiggle, walk. Use this chart to discuss why different animals move the way they do. *What body parts do the animals use to move? Does where an animal live affect how it will move?*

Animal	Swim	Fly	Jump	Run	Wiggle

Science Journal Prompt:

What causes animals to move differently?

Students should reflect in writing or pictures (dependent on student level) on how animals move differently depending on what body parts they have.

Optional: [Animal Tracking Worksheets](#)





Activity: BrainPop Jr. [Animals](#)

Field Experience: Animal Adaptations

Enjoy a visit from or visit the Retzer Nature Center's teaching animals! See how an animal's physical and behavioral traits can help it to survive as we explore the concepts of habitat and adaptation. Students will engage in collaborative groups to study the interconnectedness of the Ecosystem.

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All SDW teachers should schedule this program directly through SDW Env. Ed.

Activity: Coding Activities

Use the [Animal Adaptations](#) coding activities to supplement and reinforce the previous lessons while also introducing the concept of biomimicry. *Lesson 1 and 3 of the coding activities will reinforce [Animal Adaptations](#) and [Camouflage](#) while lesson 2 and 4 can be used to introduce or reinforce the concept of [Biomimicry](#).*

Science Journal Prompt:

How does an animal's habitat shape its adaptations?

Students should reflect in writing or pictures (dependent on student level) on how an animal's habitat effects the adaptations each has.





Activity: What's Biomimicry?

Listen and move to the music.

Discussion: Examples from nature

Using pictures and physical items, show examples of human inventions inspired by nature and ponder as a group how nature may have influenced their design (examples: parachute, Velcro, camouflage clothing, bullet train, boat sail). After some discussion, introduce 3 or 4 new items.

Activity: Animal Inspirations

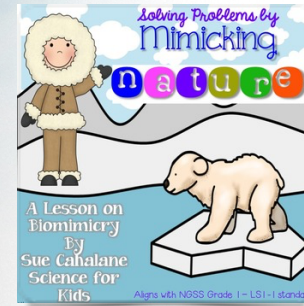
Show human made things (pictures and physical items) and ponder how nature influenced these items. Activity Sheet 1 from Knowing Science can be used as examples of plant and animal inspired products.

Science Journal Prompt:

What plant or animal inspired this object and why?

Students should choose one of the new items and reflect in writing or pictures (dependent on student level) how its invention was inspired from nature. Make sure the student notes the item chosen. *Activity Sheet 4 from Knowing Science could be used instead of this prompt.*





Read: *Solving Problems by Mimicking Nature* by Sue Cahalane

Activity: Engineer a Habitat

In small, collaborative groups have students create an invention to solve a problem. This problem can be a posed scenario, such as the one below, or students could create their own scenario. *Activity Sheet 5 of *Knowing Science* can aide students in creating their own scenarios.*

Science Journal Prompt:

How can nature inspire inventions?

Students should reflect, in writing or pictures (dependent on student level), how nature can inspire inventions.



Day 10

SUMMATIVE ASSESSMENT

Create handouts with various animals and plants, using the [Assessment Example](#).

Have students choose one animal/plant and select an adaptation. Students should explain how, if they had that adaptation, they would use it and why it would be helpful.

For advanced students, let them choose their own animal and adaptation.

	4	3	2	1
1-LS1-1 Use materials to design a solution to a human problem by mimicking how plants and/or animals use their external parts to help them to survive, grow and meet their needs.	I can apply an animal's adaptations to a human need and describe how and why this adaptation would be useful to a human as well as what materials and process an inventor would use.	I can apply an animal's adaptations to a human need and describe how and why this adaptation would be useful to a human.	I can apply an animal's adaptation to a human need and describe how it will be useful.	I can apply an animal's adaptation to a human need.

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Books:

[Hide and Seek-Nature's Best Vanishing Acts](#) by Andrea Helman

[What Do You Do With A Tail Like This?](#) By Steve Jenkins & Robin Page

[Beaks!](#) By Sneed B Collard III

[What Color is Camouflage?](#) By Carolyn Otto

[Feathers Not Just For Flying](#) by Melissa Stewart

Worksheets:

[Animal Camouflage](#)

[Animal Classification](#)

[Animal Tracks](#)

Reader's Workshop:

[Using Labels in Publishing](#)

[ScienceWorks for Kids: Learning about Animals](#)

[Body Coverings](#)

[Rainbow Fish](#)

Other Media:

[Weebly](#)

[PBS You at the Zoo](#)

[Animal Adaptations](#)

No endorsement of any business is intended.

Waukesha County, Waukesha School District, and Carroll University have collaborated to create a comprehensive, interdisciplinary K-12 science and environmental education curriculum fully integrated with NGSS Science and Literacy standards.

The goal of this curriculum is to create more scientifically and environmentally literate citizens with the ability to understand and critically assess current scientific and environmental issues, along with a desire and ability to engage in these issues. This project focuses on improving efficiencies through program coordination among partners as well as building comprehensive approaches.

